

pulse *ab* is after reflection propagated by *cd*, *cd*, equally remote from each other with *ab*, *ab*, so that *ag + gc*, or *bh + hd* are either of them equal to *aa*, as is also *cc*, but the body *BAE* being transparent, a part of the light of this Ray is refracted in the surface *AB*, and propagated by *gikb* to the surface *EF*, whence it is reflected and refracted again by the surface *AB*. So that after two refractions and one reflection, there is propagated a kind of fainter Ray *emnf*, whose pulse is not only weaker by reason of the two refractions in the surface *AB*, but by reason of the time spent in passing and repassing between the two surfaces *AB* and *EF*, *ef* which is this fainter or weaker pulse comes behind the pulse *cd*; so that hereby (the surfaces *AB*, and *EF* being so neer together, that the eye cannot discriminate them from one) this confus'd or duplicated pulse, whose strongest part precedes, and whose weakest follows, does produce on the *Retina* (or the *optick nerve* that covers the bottom of the eye) the sensation of a *Yellow*.

And secondly, this *Yellow* will appear so much the deeper, by how much the further back towards the middle between *cd* and *cd* the spurious pulse *ef* is remov'd, as in 2 where the surface *BC* being further remov'd from *EF*, the weaker pulse *ef* will be nearer to the middle, and will make an impression on the eye of a *Red*.

But thirdly, if the two reflecting surfaces be yet further remov'd asunder (as in 3 *CD* and *EF* are) then will the weaker pulse be so far behind, that it will be more than half the distance between *cd* and *cd*. And in this case it will rather seem to precede the following stronger pulse, then to follow the preceding one, and consequently a *Blue* will be generated. And when the weaker pulse is just in the middle between two strong ones, then is a deep and lovely *Purple* generated; but when the weaker pulse *ef* is very neer to *cd*, then is there generated a *Green*, which will be *bluer*, or *yellower*, according as the approximate weak pulse does precede or follow the stronger.

Now fourthly, if the thicker Plate chance to be cleft into two thinner Plates, as *CDFE* is divided into two Plates by the surface *GH* then from the composition arising from the three reflections in the surfaces *CD*, *GH*, and *EF*, there will be generated several compounded or mixt colours, which will be very differing, according as the proportion between the thicknesses of those two divided Plates *CDHG*, and *GHFE* are varied.

And fifthly, if these surfaces *CD* and *FE* are further remov'd asunder, the weaker pulse will yet lagg behind much further, and not only be coincident with the second, *cd*, but lagg behind that also, and that so much the more, by how much the thicker the Plate be; so that by degrees it will be coincident with the third *cd* backward also, and by degrees, as the Plate grows thicker with a fourth, and so onward to a fifth, sixth, seventh, or eighth; so that if there be a thin transparent body, that from the greatest thinness requisite to produce colours, does, in the manner of a *Wedge*, by degrees grow to the greatest thickness that a Plate can be of, to exhibit a colour by the reflection of Light from such a body, there shall

shall be generated several consecutions of colours, whose order from the thin end towards the thick, shall be *Yellow, Red, Purple, Blue, Green; Yellow, Red, Purple, Blue, Green; Yellow, Red, Purple, Blue, Green; Yellow, &c.* and these so often repeated, as the weaker pulse does lose paces with its *Primary*, or first pulse, and is coincident with a second, third, fourth, fifth, sixth, &c. pulse behind the first. And this, as it is coincident, or follows from the first *Hypothesis* I took of colours, so upon experiment have I found it in multitudes of instances that seem to prove it. One thing which seems of the greatest concern in this *Hypothesis*, is to determine the greatest or least thickness requisite for these effects, which, though I have not been wanting in attempting, yet so exceeding thin are these coloured Plates, and so imperfect our *Microscope*, that I have not been hitherto successful, though if my endeavours shall answer my expectations, I shall hope to gratifie the curious Reader with some things more remov'd beyond our reach hitherto.

Thus have I, with as much brevity as I was able, endeavoured to explicate (*Hypothetically* at least) the causes of the *Phænomena* I formerly recited, on the consideration of which I have been the more particular.

First, because I think these I have newly given are capable of explicating all the *Phænomena* of colours, not onely of those appearing in the *Prisme*, *Water-drop*, or *Rainbow*, and in *laminated* or plated bodies, but of all that are in the world, whether they be fluid or solid bodies, whether in thick or thin, whether transparent, or seemingly opacous, as I shall in the next *Observation* further endeavour to shew. And secondly, because this being one of the two ornaments of all bodies discoverable by the sight, whether looked on with, or without a *Microscope*, it seem'd to deserve (somewhere in this *Tract*, which contains a description of the *Figure* and *Colour* of some minute bodies) to be somewhat the more intimately enquir'd into.

Observ. X. Of Metalline, and other real Colours.

HAVING in the former Discourse, from the Fundamental cause of Colour, made it probable, that there are but two Colours, and shewn, that the *Phantasm* of Colour is caus'd by the sensation of the *oblique* or uneven pulse of Light which is capable of no more varieties than two that arise from the two sides of the *oblique* pulse, though each of those be capable of infinite gradations or degrees (each of them beginning from *White*, and ending the one in the deepest *Scarlet* or *Yellow*, the other in the deepest *Blue*) I shall in this *Section* set down some *Observations* which I have made of other colours, such as *Metalline* powders tinging or colour'd bodies and several kinds of tinctures or ting'd liquors, all which, together with those I treated of in the former *Observation* will, I suppose, comprise the several subjects in which colour is observ'd to be inherent, and the several manners by which it inheres, or is apparent